

CLAIMS

1- "Desalinization Machine", comprising of a series of vertical tube bundles, each bundle compounding an evaporator or stage, supported and sealed by an upper and a bottom tube sheet, in a multi effect process, characterised by having the assembling of the stages in a concentric disposition (Fig 1, 10 and 16), where the first stage is a shell and tube exchanger in a ring format, here named Ring Shell and Tube Evaporator (Figs 3 and 11) having a free space at the centre of the bundle, where is inserted the next stage or intermediate stage that is a bundle of tubes in a ring format, here named Ring Bundle Evaporator, having also a free space in the centre (Fig.12), where is inserted the next stage that could be another intermediate stage or the last stage that is a bundle of vertical tubes here named Cylindrical Bundle Evaporator (Fig. 5).

2- "Desalinization machine" according to claim 1, where the Ring Shell and Tube Evaporator (Fig 2 and 3) are characterized by having the following features:

- 20 a) an internal wall 3;
- b) a vapour chamber above the upper tube sheet defined by an extension of said internal wall 3 and a circumferential external wall 51 (Fig 3) welded at the edge of the upper tube sheet, with a flange on the top to support the second stage;
- c) a number of circular supports (42) (Fig. 11) equal to the number of stages less 2.

3- "Desalinization machine" according to claim 1, where the Ring Bundle Evaporator is characterized by having the following features:

- a) an internal wall 40 (Fig. 11);
- b) a vapour chamber above the upper tube sheet defined by an extension of said internal wall 40 and a circumferential external wall 52 (Fig. 13) welded at the edge of the upper tube sheet, with a flange on the top to support the succeeding stage;
- c) an external wall 47 (Fig. 5), here named armour that encloses the vapour inside the tube bundle;
- d) the upper tube sheet 30% larger in diameter than the bottom tube sheet.

4- "Desalinization machine" according to claim 1, where the Cylindrical Bundle Evaporator is characterized by having the following features:

- a) an external wall 36 (Fig.13) here named armour that encloses the vapour inside the tube bundle;
- b) a tray 19 (Fig 13) to collect salt water from the preceding stage to directs this water to the central tube 20;
- c) the upper tube sheet 30% larger in diameter than the bottom tube sheet.